Title

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Journal

Journal of Clinical Sleep Medicine, 18(8)

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Publication Date

2022-08-01

DOI

10.5664/jcsm.10098

Peer reviewed

https://doi.org/10.5664/jcsm.10098

JCSM | Journal of Clinical Sleep Medicine

SPECIAL ARTICLES

Age and weight considerations for the use of continuous positive airway pressure therapy in pediatric populations: an American Academy of Sleep Medicine position statement

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This position statement provides guidance for age and weight considerations for using continuous positive airway pressure therapy in pediatric populations. The American Academy of Sleep Medicine commissioned a task force of experts in pediatric sleep medicine to review the medical literature and develop a position statement based on a thorough review of these studies and their clinical expertise. The American Academy of Sleep Medicine Board of Directors approved the final position statement. It is the position of the American Academy of Sleep Medicine that continuous positive airway pressure can be safe and effective for the treatment of obstructive sleep apnea for pediatric patients, even in children of younger ages and lower weights, when managed by a clinician with expertise in evaluating and treating pediatric obstructive sleep apnea. The clinician must make the ultimate judgment regarding any specific care in light of the individual circumstances presented by the patient, accessible treatment options, patient/parental preference, and resources.

Keywords: obstructive sleep apnea, CPAP, pediatrics

Citation: Amos L, Afolabi-Brown O, Gault D, et al. Age and weight considerations for the use of continuous positive airway pressure therapy in pediatric populations: an American Academy of Sleep Medicine position statement. *J Clin Sleep Med.* 2022;18(8):2041–2043.

INTRODUCTION

The American Academy of Sleep Medicine (AASM) is the leading professional society dedicated to promoting sleep health. The AASM improves sleep health and fosters high-quality, patient-centered care through advocacy, education, strategic research, and practice standards. In addition, the AASM endeavors to advance sleep health policy that improves the health and well-being of the general public.

Pediatric obstructive sleep apnea (OSA) has a prevalence of 1–4%.[1] Timely treatment of pediatric OSA is essential to optimize neurocognitive development, growth, and cardiovascular health in affected children. Continuous positive airway pressure (CPAP) is used to treat OSA in children if they have significant OSA after adenotonsillectomy, are not surgical candidates, or when it is the preferred therapy. In choosing a specific positive airway pressure (PAP) device for an individual child, managing clinicians consider various factors, including availability, portability, monitoring and alarm capabilities, patient comfort, humidification, and costs.

PAP device manufacturers obtain US Food and Drug Administration authorization through the 510(k) process. PAP devices are Food and Drug Administration class II medical devices. The 510(k) process requires class II medical devices to have the same intended use and technological characteristics as the predicate and demonstrate substantially equivalent safety and efficacy to the predicate device. The manufacturers specify age and weight limits for their devices based on bench studies that examine device performance. These original specifications are typically carried forward to newer devices, perpetuating age and weight restrictions for devices never directly tested in children. In addition, these restrictions affect insurance approvals and limit treatment options for OSA management in younger and smaller pediatric patients. For example, mechanical ventilators are approved for children who weigh less than 13 kg. However, when children only need CPAP therapy, requiring them to

use more expensive ventilators as CPAP-only devices can limit access to treatment and place an unnecessary financial burden on their families. The AASM website lists examples of commonly used commercially available home PAP devices with their manufacturers' age/weight specifications.

To address these concerns, the AASM commissioned a task force of sleep medicine physicians with expertise in pediatric sleep medicine to develop a position statement regarding age and weight considerations for pediatric CPAP therapy. The task force reviewed published evidence on this topic and considered factors such as safety, cost/access, contraindications, and limitations of CPAP therapy in children. Details about the literature search can be found in the supplemental material.

POSITION STATEMENT

Regarding age and weight considerations for pediatric CPAP therapy, it is the position of the AASM that when managed by a clinician with expertise in evaluating and managing pediatric OSA, CPAP can be safe and effective for outpatient treatment of OSA for pediatric patients, even children of younger ages and lower weights.

DISCUSSION

OSA impacts children of all ages, with deleterious consequences if left untreated. CPAP has been widely used for many years to treat pediatric OSA; however, there are few prospective studies evaluating age and weight criteria for home CPAP therapy. Available research consists primarily of retrospective studies, case series, and case reports with significant heterogeneity. Although most studies about CPAP device use in children report age, some only report body mass index rather than weight. Weight could be inferred based on the age of the individuals; however, this estimation may be unreliable, particularly in children with failure to thrive, obesity, and/or complex medical conditions.[2]

Despite these limitations, multiple studies show that home CPAP devices can provide safe and effective OSA treatment for children, ranging in age from infancy to adolescence.[3–10] CPAP therapy benefits both healthy/typically developing children as well as those with complex medical conditions[11–15] and improves neurodevelopmental outcomes.[16,17] Of note, CPAP treatment in infants and young children is typically started in a monitored environment, either in a hospital setting or during an attended sleep study using titration equipment comparable to commercially available PAP devices.[9–11,18–21]

Even in young children, adverse events related to home CPAP therapy are rare and similar to those commonly described in adults (skin redness, eye irritation, mask fit challenges). However, compared to adults, children are more likely to need CPAP desensitization and a longer time to achieve adherence.[22–24] Additionally, clinicians need to monitor facial development in children on PAP therapy since the nightly application of the CPAP mask can alter facial growth.[8,15,21,25] Finally, while not affecting the efficacy of CPAP delivery, proprietary algorithms utilized by PAP device manufacturers may provide inaccurate adherence and therapeutic data in younger and smaller children, including but not limited to usage and estimated residual apnea-hypopnea index (AHI). Therefore, clinicians need to interpret these data with caution for both clinical and insurance coverage determinants.[2]

FUTURE DIRECTIONS

There is a need for well-designed studies regarding the use of home CPAP to treat pediatric OSA, specifically in infants and young children. They should incorporate the process and outcome measures delineated in the current AASM "Quality Measures for the Care of Pediatric Patients with Obstructive Sleep Apnea."[26] Studies should also specify participant age, weight, clinical history, OSA severity, device, interface, and treatment outcomes.

CONCLUSIONS

There are no established absolute contraindications to using home CPAP therapy for pediatric OSA based on age or weight restrictions. However, requiring that younger and smaller children with OSA receive CPAP therapy only from a home ventilator rather than a less-expensive PAP device increases the financial burden on these families and affects access to care. Therefore, it is the position of the AASM that CPAP can be safe and effective for outpatient treatment of OSA for pediatric patients, even in younger and smaller patients, when managed by a clinician with expertise in evaluating and managing pediatric OSA.

ABBREVIATIONS

AASM, American Academy of Sleep Medicine
CPAP, continuous positive airway pressure
OSA, obstructive sleep apnea
PAP, positive airway pressure

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SUBMISSION & CORRESPONDENCE INFORMATION

Submitted for publication May 25, 2022
Accepted for publication May 25, 2022
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DISCLOSURE STATEMENT

The authors include members of the 2021–2022 American Academy of Sleep Medicine Board of Directors. Ms. Kazmi and Dr. Thomas are employed by the American Academy of Sleep Medicine. The other authors report no conflicts of interest.